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ECONOMIC COMMISSION FOR ASIA AND THE FAR EAST

CAMBODIA, LAOS, THAILAND AND VIET-NAM

Committee for Coordination of Investigations of the Lower Mekong Basin

Nineteenth Session (Plenary)
8 - 14 January 1963
Vientiane, Laos

STATEMENT OF WMO EXPERT

at

the Nineteenth Session of the Mekong Committee

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Mr. Chairman,
Gentlemen,

..... The Committee will remember that six months ago, in June 1962, we bade farewell to Harza Corporation, whose contract had come to an end.

Situation at time of departure of Harza Corporation

Generally speaking, the situation at the time of departure of Harza Corporation was as follows: in accordance with the recommendations of the Wheeler Report, a network of hydrologic stations, consisting of 31 recording gauging stations and five non-recording stations, had been installed. These recording gauges had been delivered to the Japanese Team working in Laos, and three recording gauges which it had not been possible to install owing to security conditions were still to be set up on the Nam Ou, the Nam Sung and the Se Done. A network of 50 meteorological stations had been set up as recommended in the Wheeler Report; the installation of 29 stations has been delayed for similar reasons of security.

A staff of some 100 operators and engineers had been trained to ensure continuation of the programme. Equipment and current consumption goods valued at some $500,000 (United States, France, New Zealand, United Kingdom) had been transferred to the Committee. This equipment includes transport equipment, technical equipment for the gauging stations, scientific and office equipment. The transfer of title of this equipment was effected according to a memorandum of agreement signed during the Eighteenth Session of the Committee, held in Bangkok, and providing that said equipment would be used to continue the survey work begun by Harza Corporation. To be complete, we should also mention the new offer made by the United states delegation during the Eighteenth Session and gratefully accepted by the Committee, for provision of spare parts and equipment for certain portions of the network during the

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next five years. According to the estimation of the engineers and the WMO expert, about $220,000 would be necessary during the next five years to ensure maintenance of all the above-mentioned equipment. Finally, apart from the installation of the hydrologic and meteorologic networks, the training of personnel, and the transfer of equipment, the three-year Harza programme also included the preparation and publication of 11 reports on basic data, a complete set of which has been distributed to each of the members of the Committee.

Continuation of programme

During the last year of the Harza programme, the Office of the Executive Agent had been considering in cooperation with Harza Corporation, the question of organization of the four hydrologic services, one in each riparian country, who would ensure continuation of the work after expiration of the Harza contract. These services have in fact been set up within the framework of the Public Works Department in Cambodia, Laos and Viet-Nam, and under the auspices of the National Energy Authority in Thailand. The programme has been continued according to the recommendations of the Harza engineers and of the WMO Expert. Some 200 additional discharge measurements have been made in all hydrologic stations, and the basic data has been systematically collected, classified and partly analyzed. Generally speaking, the equipment had been well maintained, taking into account the fact that it had already been in service for over two years, and considering the incomplete technical training of a certain number of operators.

No programme is wholly without incidents, and some incidents occurred due to circumstances beyond the control of the operators: a 24-foot boat was burned in Viet-Nam due to an accident, the recording gauge at Thakhek has to be re-installed due to a landslide on the river bank, the staff of the recording gauge at Stung Treng as well as the pressure intake was destroyed by the Mekong, the slope of the recording gauge at Kompong Chhnang was upset by a land subsidence, a jeep was damaged in an accident in Thailand and will have to be replaced as soon as possible, etc.

Generally speaking, in spite of those incidents the data collection programme continued without interruption.

Current problems

At the end of this six-month programme, I feel it is necessary to give a general picture of the position in the light of experience gained and to

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evaluate our current problems. Such problems or difficulties include four categories: personnel, equipment, organization and budget.

Personnel. In charge of the four hydrologic sections are graduate engineers who took up their functions in 1962 in a satisfactory manner. These engineers control a certain number of observers. In order to avoid any misunderstanding, let us state that the term "operators" refers to technical assistants with no thorough theoretical training. In part I wish to comment on the qualifications of such "operators".

In all modern organizations there is a personnel pyramid headed by the Engineer-in-charge, who supervises the auxiliary personnel, which becomes more and more numerous as we go down the scale. A good structure of the basis of such a pyramid, represented in this case by the operators, is indispensable in order to ensure maximum efficiency. I stated a moment ago that generally speaking the engineers are perfectly competent for the implementation of their task; they generally have excellent knowledge of English or French and have been able to derive maximum benefit from the training provided by Harza; on the other hand, it is obvious that this category of personnel can more easily obtain foreign scholarships than the operators. In consequence, our main lack is for intermediate implementation personnel, i.e. the operators, and it is indispensable to consider necessary ways and means to train such personnel. I might choose examples in the field of hydrology or meteorology or in any other field, but I shall select, to illustrate our need for operators, an example in the field of mechanics: we have a total of 25 boats and 13 jeeps; in particular, the 24-foot boats used for hydrologic measurements are equipped with 50 H.P. outboard motors. These 50 H.P. motors are not only complex, but also costly. A motor which has been badly maintained by a non qualified operator involves expenses and interruptions in the programme. I have been able to observe during my various field trips that there is no lack of good will, therefore it is only necessary to find a practical method to provide the necessary training, especially in the field of mechanics, where our need is the most urgent. In my view, the training of this operator personnel might be envisaged in three different ways:

/ - Training

- Training periods, possibly organized under external scholarships;
- Local technical schools;
- Training under the supervision of experts.

I reserve the right to discuss this later with the parties concerned, but I wish to draw the attention of the Committee to this problem immediately.

Equipment. This problem has been partly solved thanks to the project for provision of spare parts and equipment, for which the memorandum of agreement is ready for signature. Nevertheless, I should like to insist upon three points, viz:

- The question of time: in a certain number of cases in Viet-Nam, where a boat was destroyed; in Thailand, where a jeep was badly damaged in an accident and has to be replaced; in the case of certain recording gages; for instance, we have an urgent need for spare parts and equipment; any delay implies an interruption in the implementation of the programme.

- It is also necessary to provide for sufficient flexibility for the replacement of the necessary equipment; for instance, constructors no longer produce 50 H.P. motors; therefore, it will be necessary to consider two 40 H.P. motors, or one 75 H.P. motor, or another acceptable solution. The Viet-Nam boat (24 feet) has to be replaced; the Viet-Nam Navigation Department might build such a boat, provided a certain quantity of imported raw materials is furnished.

- There is also the question of storing, which is related both to the problem of training of operators and to the problem of organization.

Organisation. At the center of operations, the problem has been solved with the recruitment of two assistant hydrometeorologists in Vientiane and Phnom Penh, and of a General Service agent, a secretary and a draughtsman in Bangkok. On the local plane, the organization effort should be continued under the supervision of the Engineer-in-charge.

Budget. In 1962 a total budget of $323,000 was contemplated for all four countries for the 1963-1964 financial year. It is now necessary to make provision for the 1963-1964 budget, for which estimations will be facilitated by our recent six months of experience.

Programme

In my view, the three-year Harza programme must be considered as a beginning in the inventory of the water resources of the Mekong Basin.

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This being so, the Harza network of stations constitutes the backbone of the complete network to be established in the years to come. Therefore, I feel it will be necessary to expand this network and to consider a realistic optimum programme, taking into account current resources in equipment and personnel. The operation of such a network and the collection of basic data on additional tributaries will make it possible to provide answers in fifteen, twenty or thirty years' time to the questions which were already raised five years ago and led to General Wheeler's recommendations. At the beginning, it might suffice to install a few additional staff gages, which are not costly, and to appoint an observer; a programme of discharge measurements might be carried out with the existing equipment and teams, including the cooperation of the assistant hydrologists headquartered in Vientiane and Phnom Penh. Expansion of the hydrologic network is also necessary to solve the related problems of local construction of bridges, roads, dikes, levees, etc., all these problems having already been raised with the framework of Mekong projects, such as the projects for a delta model or for flood warning. The Mekong delta presenting some of the most complex hydraulic problems in the world. Every cubic meter of water artificially used involves perturbations extending throughout the system. In other terms, for instance any hydraulic structure downstream of Kratie must necessarily be based on ample hydrologic data which we would be well-advised to collect as from now.

For instance, in Viet-Nam, the area from Chau-Doc on the Bassac appears to function in flood period as a collector for a substantial portion of the Mekong discharge. A priori, a molecule of water moving down from Kratie can reach the sea, by two possible routes, i.e. through the Mekong or through the Bassac. But in fact there is a third possibility: to overflow from the Mekong bed into the drain between the Mekong and the Bassac, and then to follow the Bassac, then Chau-Doc River, and Takeo River and to arrive by that oblique route somewhere in the vicinity of Chau-Doc. Roughly speaking, we may say that any overall development of the delta should include a water collection in that area. Therefore, it should be interesting to know as soon as possible how the waters are distributed in the region. In other terms, the average discharge of some

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15,000 m3/sec at Kratie ultimately reach the sea following a certain pattern which we must ascertain. Practical methods of discharge measurements in the stations influenced by the tide remain to be studied. We might also mention other problems in Viet-Nam, such as the statistical estimation of discharges in the natural or artificial canals which carry the Mekong discharge; in particular it would be necessary to measure the discharge of the two Vaicos, which discharge we estimated to more than 5,000 m3 in flood period.

In Cambodia, the delta problems are somewhat different but equally complex, and they are made even more so by the problem of the Great Lake. For instance, any development project between the Mekong and Bassac would require a knowledge of the inflow from the right bank of the Mekong and exchanges from the left bank of the Bassac. A project on the left bank of the loop of the Mekong at Phnom Penh would require detailed study of the Tonle Toch, which short circuits the Mekong between Kompong Chhan and Neak Luong. The same is true between the right bank of the Mekong and the Prek Kdam - Kompong Thom road, as well as in the Bassac area.

In Thailand, we may mention the case of the Nam Mun and Nam Chee rivers, which raises a problem of flood prediction necessitating an increase in the number of hydrologic stations. The problem is rendered more complex by the fact that the course of the Nam Chee is not yet stabilized.

Finally, in Laos, without mentioning the hydrologic problems raised by Pa Mong Reservoir and by navigation, it will be necessary to evaluate the considerable hydraulic potential, which will involve a systematic survey of the regime of all types of rivers.